Assessing the impact of the 2006 Tax Reform on poverty and inequality in Uruguay

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RESEARCH PROPOSAL

Presented to

PEP Network

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&

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Uruguay

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Abstract

In the context of a sharp rise in poverty incidence since the end of the last decade, the present government presented to Congress a Tax Reform bill which was approved last month and will be enforced by the middle of 2007. This reform was formulated within the Plan for Equality of the government, as it is believed that its redistribution effects will be a strategic component for redesigning the social protection system in the country. Therefore, one of the explicit objectives of the proposed reform is to promote greater equity and progression in the tax system.

The aim of this project is to assess the possible effects on the labour market, on poverty and on inequality of the tax reform recently approved by the Uruguayan Congress, as well as alternative changes to the tax regime. In order to address this question we will develop a dynamic general equilibrium model (CGE) with emphasis on fiscal revenues, and a microsimulation model.

The advantage of CGE models is that they allow the evaluation of the direct and indirect effects of those policies, working as an instrument for counterfactual analysis. The analysis will be complemented with microsimulations as a way to estimate the effects on poverty and inequality.
1. Main research questions and core research objectives

Although Uruguay has historically shown low levels of poverty and inequality in comparison with the rest of the Latin-American region, recent trends of poverty incidence have not been encouraging. Even though during the first half of the nineties poverty incidence was significantly reduced with respect to the previous decade, this situation reversed in 1995 and poverty incidence increased, specially since the financial and economic crisis that began in 1999 and had its climax in 2002. During this period wages lost more than 20% of its purchasing power, and the unemployment rate reached its historical maximum.

During 2002, poverty incidence did not only increase, but it also deepened, so that on average, the distance of the poor to the poverty line increased (Amarante et al, 2004). In spite of the strong post-crisis economic growth and the reduction of unemployment, poverty incidence is still very high in comparison to the levels it attained by the mid-nineties. In 2005 29.8% of urban population was below the national poverty line, almost reaching the same level it had in 1990. 1

Although the 2002 crisis provoked a steep jump in poverty incidence, it has been pointed out that it did not represent a change in its trend, but rather a deepening in the trend showed during the second half of the nineties. The increase in poverty incidence derives mainly from the increase in wage differentials of highly qualified workers, and from unemployment growth, as well as from other changes in income distribution (Amarante, et al 2004). Income distribution in Uruguay has been relatively stable since 1986, but it has shown a moderate deterioration during the second half of the nineties, which continued during the crisis.

In this context, the government that took office on March 2005 sent a tax reform bill to Congress which was approved last month (January, 2007), and which will be enforced by the middle of 20072. It is the first structural tax reform after 30 years, and it is considered a part of an Equality Plan (Plan de Equidad) designed by the government, as one of the structural

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1 Rural population in Uruguay represents only 6.3% of total population.
2 Uruguayan Law Nº 18.083, known as the Tax System Reform.
components of a matrix for social protection, whose implementation implies a medium and long-term operation.

Thus, the government considers that the redistribution impact of this tax reform is a strategic aspect for the redesign of the social protection system, and an essential part of the Equality Plan.

The explicit goals of the proposed tax reform are: i) to promote greater equality and progression in the tax structure, relating the tax burden to the taxpaying capacity of each agent; ii) to promote greater efficiency of the tax scheme; iii) to stimulate investment and employment, creating conditions that promote economic growth. In order to achieve these goals, the tax reform bill is based on a simplification and rationalization of the tax structure, seeking for greater consistency between the characteristics of the different taxes.

On this basis, the main proposed changes are given by: a) the introduction of a direct income tax on households (Impuesto a la Renta de las Personas Físicas, (IRPF), which affects differently capital and labor income (dual tax); b) changes in the tax base and rates of the Value Added Tax (VAT); c) changes in direct taxes on enterprises through the introduction of the Impuesto a la Renta de las Actividades Económicas (IRAE), with a broader base and changes in rates related to re-investment of profits; and c) modifications on labor factor tax, through the homogenization of the employer contribution rate to the social security across economic activities. Additionally, in order to simplify the tax structure, fourteen taxes that accumulate approximately 20% of total fiscal revenues are eliminated.

It is possible to say that the implementation of this reform implies a structural change in the country tax policy. This perception generates the need to count on appropriate instruments to assess the direct and indirect effects of the reform on different aspects of economic activity, particularly on the labor market, on poverty and on inequality.

Given the lack of appropriate instruments, both in academia and in government, to assess the full impact of tax policy changes, this project aims at implementing a useful methodology to
assess the possible impact of this tax reform (as well as possible future tax modifications) on employment, poverty and inequality, taking into account the general equilibrium effects through time.

Specifically, we aim to develop a dynamic computable general equilibrium model (CGE), with emphasis on the modeling of fiscal revenues in order to allow the assessment of the most important changes introduced by the tax reform. The effects on savings, investment, growth and welfare will be particularly considered. Then, the simulation results of the dynamic CGE model will be used as a counterfactual scenario to estimate the effects on poverty and inequality using a microsimulation methodology.

At the international level, CGE models are widely used to simulate the effects of different policy options, particularly tax policy or public transfers, as they provide a framework to analyze the direct and indirect effects of policy options, through counterfactual analysis. Despite their frequent application worldwide, Uruguay has not had great experience in applying this type of model to the analysis of the tax system, particularly in a dynamic setting.

The evaluation of the possible impact of the tax reform using the proposed methodology implies the following activities:

1. Elaboration of a new Social Accounting Matrix (SAM), using the last Input-Output Matrix published last year by the Uruguayan Central Bank with data for 1997, more updated National Accounts data and complementary data about fiscal revenues.
2. Development of the dynamic general equilibrium model with emphasis on the modeling of fiscal revenues.
3. Development of the microsimulation model that allows simulating different effects of changes in the labor market and household income, due to changes projected in the tax reform bill.
4. Evaluation of the effects of introducing the personal income tax *(IRPF)* on employment, poverty and inequality.
5. Evaluation of the effects of changes in the VAT on employment, poverty and inequality.
6. Joint evaluation of the two previous changes.
7. Evaluation of the effects of the implementation of the direct tax to enterprises (IRAЕ) on employment, poverty and inequality.
8. Evaluation of a uniform employer contribution rate to the social security system on employment, poverty and inequality.
9. Joint evaluation of the two previous changes.
10. Joint evaluation of all previously mentioned changes.

2. Scientific contribution of the research including a short list of key references in the literature and knowledge gaps.

At the international level, CGE models have been a widely applied methodology for policy reform evaluation, regarding aspects like trade, structural change, social policies, environmental aspects or tax policy. Particularly, tax policy evaluation and impacts across different aspects of economic activity using CGE models are widely spread across countries, though only recently in the Latin American region.

Shoven and Whalley (1972, 1984) were pioneers in evaluating tax policy using a CGE model, and in their well-known 1984 article they made a revision of the first applications of this methodology to trade and tax policy. Piggott (1980) and Serra-Puche (1984) worked on tax policy aspects for Australia and Mexico with a similar approach as Shoven and Whalley. It is also necessary to mention the joint work by Piggott and Whalley (1985) applied to the United Kingdom. This work set the basis for later research and application of CGE models to tax policy and fiscal expenditure across a great number of countries.

Among recent research from the Latin American region, we must quote the one done by de Souza Ferreira Filho, Vieira dos Santos and do Prado Lima (2005). This research aims to assess the impact on poverty and inequality of a tax reform project in Brazil, using a CGE model and microsimulation methodology. In another direction, Cathal O’Donoghuel (2005) applied a microsimulation methodology to simulate effects of different tax schemes and social benefits in Brazil.
In Uruguay, there is some research focused on the evaluation of the tax system, and, more specifically aimed at the analysis of impacts of the pre-reform tax scheme on the distribution of income (Grau and Lagomarsino, 2002; Perazzo, Robino and Vigna, 2002). Previously, Paolino and Laens (1994) evaluated the impact of different tax options for the agricultural sector, using a simple CGE model. In the particular case of studies focused on tax reform proposal and evaluation, recent work was done by Barreix and Roca (2003, 2006) and Grau, Lorenzo and Oddone (2004).

Although each of these studies represented important progress in the state of knowledge of tax policy and its impacts in Uruguay, they are all based on partial equilibrium analysis. The exception is the research carried out by Paolino and Laens (1994), using a simplified formulation of a CGE model. Although partial equilibrium analysis provides information about the direct effects of a particular policy, they do not inform about “second order” or indirect effects, which may illustrate about possible non-desirable effects of the policy.

By developing a dynamic CGE model combined with microsimulations, this project will allow to obtain an explicit specification of the behavior of different economic agents, and predict the probable responses of households, enterprises or other agents facing different policy options. On this basis, it is possible to assess the direct and indirect effects of the application of the proposed tax reform, working as an instrument for counterfactual analysis. The combination of a dynamic CGE model with microsimulations allows assessing the impact of the tax reform on poverty and inequality taking into account the full income distribution.

The explicit modeling of agents’ behavior in a dynamic general equilibrium framework, accounting for indirect effects and temporal dimension are the main contributions of this project in comparison to previous studies. Moreover, the model could provide a good instrument for the analysis of further modifications of the tax system.
3. Policy relevance

This project will allow obtaining a rigorous quantification of direct and indirect effects of the tax reform recently approved, on the labor market, poverty and income distribution. Thus, it will allow us to draw conclusions about its effects on savings, investment, employment and other macroeconomic variables and its contribution to one of its central goals, namely, the achievement of a more equal distribution of income and poverty reduction. In spite of this, the potential use of the instrument to be developed exceeds the evaluation of the current tax reform, as it could be used to assess potential future modifications in tax structure.

Potential users of the results of this research are those interested in using the dynamic CGE model as an instrument for policy evaluation and those interested in the specific results of the evaluation of this particular tax reform. As for the first, it should be taken into account that up to now there has been no research focused on tax policy evaluation within a dynamic general equilibrium framework. Thus, this work will be the first of its kind for Uruguay, and it eventually could serve as basis for further research. Both the public sector and the academic community are potential users of this work.

As for the specific results of the evaluation of the current tax reform, potential users besides the above mentioned are entrepreneurial chambers, unions, corporations and, in general, all people interested in knowing about the impact of this important change in the tax structure to be implemented by the middle of 2007.

But the main potential users both of the results of the tax reform evaluation and of the model itself as a tool for evaluation are policy makers. In this sense, government has declared that the tax reform approved by Congress is the “first step” towards a more rational and progressive tax system. Future modifications are foreseen, presently not included for a number of reasons (being the most important the budget constraint and the lack of appropriate instruments for evaluating their impact). Precisely, there are four aspects that the government has already established as the next steps in tax reform: elimination of other distortive taxes; elimination of specific taxes paid by the public sector; reduction of transfers
from public enterprises; reduction of two additional percentage points in VAT (Uruguayan Ministry of Economics and Finance, 2006).

In addition to these future changes, other alternative policies attaining the same goals could be explored in this research. In particular, the equity and poverty impact of increasing the level of minimum non-taxable income, and the elimination of the employers’ contributions to the social security system (especially its impact on the labour market) will be analyzed, evaluating their effects in a dynamic context. Also, we will try to evaluate new reductions of the direct tax to enterprises together with increases in taxes on distributed profits. As pointed out by policy makers at the Ministry of Economics and Finance (MEF), all these aspects were not introduced in the present reform, some for fiscal constraint reasons (as the elimination of the employers’ contributions to social security) and others for lack of information about their possible impacts.

Thus, we believe that this work will provide a useful tool for tax policy evaluation and, more precisely, for the evaluation of the present and forthcoming modifications of the tax system. Most importantly, there is interest on the part of the MEF in counting on these techniques and tools that allow to adequately assess, not only the global impact of the present tax reform, but the modifications that are already foreseen, as well as other alternatives not yet explored.

4. Methodology

The proposed methodology has two main components: a dynamic computable general equilibrium model, with emphasis in modeling fiscal revenues and a microsimulation procedure to evaluate the effects on poverty and inequality taking into account the full income distribution.

CGE models applied to fiscal policy consider the impact of tax distortions, structural characteristics of tax systems, and gains and losses of welfare associated to tax change. The
advantage of this methodology is that it explicitly models agents’ behavior, so it allows identifying the changes in that behavior when they face tax modifications.

Previous research in Uruguay using CGE models have focused on trade policy, particularly changes derived from the integration of Uruguay to the Mercosur (Laens and Terra, 2000, 2005, 2006). There was also an attempt to apply these models to tax policy (Laens, 1994), and more recently, applications combining CGE models with microsimulations (Laens and Perera, 2004; Terra et al., 2006). All these studies used static CGE models, which allow the simulation of changes in policy options but without taking into account the temporal path for achieving the simulated scenario derived from policy change. Laens and Llambí have recently finished a research work (Laens and Llambí, 2007) where they applied a dynamic CGE model that allows assessing the impact of different variables through time, either from a once-and-for-all shock or from continuous changes in some of the parameters or exogenous variables in the model.

We believe that a dynamic CGE model that allows us to track the effects of tax policy on capital accumulation and employment is the most adequate instrument for tackling the goals of this project. Consequently, we propose to develop a dynamic CGE model focused on fiscal policy analysis, with emphasis on the tax system. For this purpose, we will take the model used by Laens and Llambí (2007) as a starting point, introducing specific aspects of the tax regime and some new features to the labor market modeling.

The model used in that research work is an application for Uruguay of the model MAMS (MAquette for MDG Simulation), documented in Löfgren and Díaz-Bonilla (2006). The MAMS is a dynamic CGE model especially designed to analyze alternative strategies to achieve the Millennium Development Goals (MDG) and, more generally, to study strategies for economic growth and poverty reduction.

The MAMS model has three modules. The first one is a static CGE model based on the standard model documented in Löfgren et al (2002). The second module contains a dynamic recursive process where some parameters are updated (factor supply, population,
productivity, etc.) on the basis of exogenous trends or past values of endogenous variables obtained as a result of the first module. The third module refers to the MDG and is not relevant for the research we propose, except for the evolution of labour force qualification over time.

The first two modules which will be the basis for our model have the following characteristics:

- Production in each sector is specified as a nested production function. At the top level value added and intermediate inputs are combined with fixed coefficients (Leontieff technology). At the lower level production factors are combined through a constant elasticity of substitution function (CES).

- Domestic and imported goods are imperfect substitutes following an Armington specification. In turn, production is sold to the domestic market or exported following a constant elasticity of transformation function (CET).

- The small country assumption is adopted both for imports and exports so international prices are exogenous.

- Household consumption is derived from a Linear Expenditure System (LES)

- Private capital is mobile among sectors but government enterprises use specific capital.

- Population growth is exogenous, and follows official projections. Labour force participation is endogenous and depends on school progression (people at working-age that continue studying, graduate or quit school) and some parameters obtained from historical data (i.e.: depreciation rates).

- The labour market is segmented according to workers qualification (years of schooling). Labour force is mobile across sectors. Both wages and unemployment are endogenous in each segment, but neither of them can fall below a given level. In other words, it is assumed that there is some degree of structural unemployment and that there is a wage level below which workers are not willing to work. This wage
level depends on the employment rate, per capita consumption (as a proxy for the standard of living), factor returns and inflation.

- In each year, investment is determined at the macro level using alternative closures (investment driven or savings driven). Given the interest of MAMS model in government consumption and investment, the allocation of total investment to private activities just follows the initial capital shares.
- Debt accumulation is considered in the model. Households buy government bonds. Government also borrows from the rest of the world.

For the study of tax reform, we intend to introduce several changes to this model. First of all, the disaggregation of the model needs to be changed, because the present model emphasizes government activities related to MDGs and has little disaggregation for the private sector. Similarly, enterprises will have to be disaggregated and households will need more detail (i.e. according to groups defined on the basis of income). And, very importantly, more disaggregation of taxes has to be made. In particular, we will add more detail in direct taxation on enterprises, in employers’ contribution to the social security system and direct taxation to households.

In addition, we will try to introduce some changes in the equations of the model, particularly in those related to the labour market (as it is the main channel between the CGE and the microsimulation model). We will add a new level to the nested production function in each sector, in order to admit some degree of substitution between labour with different qualifications.3 We will also take into account the options discussed by Annabi (2003) for modeling different market imperfections and the progress made in Terra et al (2006) in modeling the informal sector. One of the goals of this reform is to promote more formalization of the economy and to reduce evasion. The evaluation of this objective requires an explicit modeling of the informal sector. The feasibility of this aspect is to be evaluated as part of the project.

3 For example, we could assume that semi-skilled labour is an imperfect substitute for skilled labour, so we could combine both types through a CES function nested in the present value added CES function.
The dynamics of the model will also be revised. Even though we intend to maintain the recursive format, we will improve the allocation of new investment across sectors, as discussed in Annabi, Cockburn and Decaluwé (2004).

The changes in the model that will be made ask for a different SAM. The availability of new inter-industry data released by the Central Bank will allow us to do the necessary disaggregation. The balancing and updating of the SAM will be carried out using the cross entropy method documented in Robinson et al (2001).

The simulated results of the dynamic CGE model will provide information about the effects of tax modifications on the main macroeconomic variables and on the labor market. However, CGE models are not the most appropriate instrument for evaluating the impact on poverty and income distribution, as they typically distinguish among few groups of households (e.g. classified by deciles of per capita income). This problem has led to the development of an important stream of research that combines CGE models with microsimulations (Robilliard, Bourguignon and Robinson (2001); a review of the main characteristics of these approaches can be found in Bourguignon, Pereira and Stern (2002), and Davies (2004)). This project will complement the dynamic CGE model with microsimulations using micro data from National Household Surveys.

We plan to use the microsimulation methodology proposed by Ganuza, Paes de Barros and Vos (2002), an adaptation of the methodology originally developed by Almeida dos Reis and Paes de Barros (1991). In the case of Uruguay, this methodology has been used with minor changes in Laens and Perera (2004), Terra et al (2006) and Laens and Llambí (2007). Basically, it consists of simulating the labor market and income structure that results from the simulations with the CGE model, using micro data of household surveys, to obtain poverty and inequality indicators consistent with that simulated structure. Thus, the approach is of the “top-down” type; that is, from the policy shock, through changes in prices of goods and factors, employment and income to poverty and income distribution, assuming no additional feedback effects.
The microsimulation procedure proposed by Ganuza et al follows a non parametric technique. It does not specify income and labour-choice models to determine the effects of price, level and structural changes in the labour market on poverty and inequality as proposed in Bourguignon, Fournier and Gurgand (2001) or in Bourguignon, Ferreira and Lustig (2001). Instead, it assumes that occupational shifts may be proxied by a random selection procedure within a segmented labour market structure. That is, random numbers are used to determine which people at working age will change their labour force status; who will change occupational category; and so on. By applying a Monte Carlo procedure confidence intervals for the outcomes of the simulations (poverty and income distribution coefficients) are obtained. The technique allows us to impose counterfactual changes in key labour market parameters (such as participation rate, unemployment, employment structure, wages, wage structure) on a given distribution obtained from household survey data and estimate the impact of each change on poverty and inequality at the household level.

An advantage of this approach is that it allows for assessing the impact of these changes either in an isolated form or sequentially. However, as pointed out in Vos (2002), the important assumption made is that, on average, the effect of the random changes correctly reflects the impact of the actual changes in the labour market.

In the microsimulation model applied in Laens and Llambí (2007), the labour market structure is defined in terms of unemployment, employment, skill and remuneration structure, and the general level of remuneration:

\[ \lambda = f(E, W1, U, M, W2) \]

where \( E=[e_{kj}] \) represents the employment structure, whose elements represent the share of type \( j \) individuals employed in segment \( k \) of the labour market; \( W1=[w_{kj}] \) represents the remuneration structure; the vector \( U=[u_j] \) represents the unemployment rate of type \( j \) individuals; \( M \) represents the skill composition of the workforce, and \( W2 \) the overall remuneration level.
Four types of individuals were defined on the basis of educational attainment (completed primary, completed basic secondary, completed secondary and completed tertiary education). The employed workforce was classified according to three segments, defined on the basis of sector of activity (primary sector and export industries, domestic market oriented industries and services).

This study will modify the previous microsimulation model in the following directions. First, we will change the segments and types of individuals considered in the existing model. The segments will be defined according to sector of activity and occupational category. Sectors of activity will be classified according to the different changes implied by the tax reform on taxes they face (i.e. implementation of a uniform employer contribution rate to the social security system implies an increase in the tax burden of manufacturing industries, and a decrease for commerce and services). The same criteria will be applied in defining occupational categories (i.e. incorporating wage and non wage earners, as the planned tax reform implies different changes in the tax rate on wages and non-wage income).

Second, the labour structure will include participation rates among different groups of the population at working age defined according to (at least) educational level. Thus, variations in participation rates are intended to be considered in the microsimulations.

At least the following CGE outcome variables will be fed into the microsimulation model: participation and unemployment rates for each group of the population classified at least by educational level; quantity of labour demanded and remunerations for each occupational category and sector of activity; overall remuneration level; and educational level of the employed in each occupational category and sector of activity.

A pointed out limitation of this (static) microsimulation approach linked to a dynamic CGE is that implies imposing a counterfactual labour market structure generated by the dynamic CGE model several years ahead from the base year household survey. In spite of this, although no change in the population structure is assumed, the model applied in Laens and
Llambi (2007) considers an updating of human capital stock variables, and we intend to preserve this characteristic in our new model.

In each simulation, the incidence, depth and severity of poverty (FGT0, FGT1 and FGT2, based on Forster, Geer and Thorbecke (1984)) and the Gini coefficient of the distribution of both per capita income and labour income will be calculated⁴. We will use the National Poverty Line proposed by the National Institute of Statistics (INE).

5. Data requirements and sources

The specification of a CGE model needs to give values to different parameters of the model, some of which must be estimated using econometric techniques, while others are calibrated using a Social Accounting Matrix (SAM). In Uruguay, the most recent SAM is a matrix calibrated for year 2000⁵, based on the structure of the 1983’s input-output matrix, but Laens and Llambi have updated that matrix to 2005 for their recent research. Since recently the Central Bank of Uruguay has published a new matrix, based on 1997 data, this proposal intends to elaborate a new SAM, based on this information, and taking into account a proper disaggregation between relevant sectors and agents, as an instrument to evaluate changes in the tax system. The elaboration of this matrix is going to be a worthy product of the project, since it will be an updating of the underlying coefficients used in the available SAM. However, as 1997 does not seem to be an appropriate benchmark for this project, we will use a cross entropy method to update it with National Accounts data for 2005.

This project aims to review previous econometric estimates of the relevant parameters of the model, and to make its own estimations when those are not available or when they are crucial parameters for the model. As an example, the CGE model requires the estimation of the elasticity of substitution between local and foreign goods, or between production factors.

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⁴ FGT1 computes the mean distance from the poverty line of the poor households. FGT2 allows a weighted estimation of the distance from the poverty line of poor households, where more weight is assigned to the more far from the poverty line.
Finally, the microsimulations will demand to work with the National Household Survey, published by the National Institute of Statistics (INE). An important part of the work to be done is the specification of the different sources of household income, and their links to factor and product markets.

6. Dissemination strategy:

This project is going to be developed at the Centro de Investigaciones Económicas (CINVE). This center is a private academic non profit institution that began its activities in 1975. The group of economist and related professionals that work in the center are dedicated to research, teaching and consulting in economic subjects and quantitative techniques.

One of the main traditions of this centre consists of offering the greatest possible diffusion to the academic work done by its researchers. Much of the research work undertaken at CINVE has been presented both in academic and governmental events. Following this tradition, we plan to give the greatest possible diffusion to the results of this research.

Once a preliminary version of the research is ready, it will be delivered to the staff at the MEF and at the Ministry of Labour and Social Security. We plan to organize one or two workshops to discuss with them and other relevant agents the results of the research. We hope this discussion will enhance our research work and make it more useful for specific problem-solving.

We also plan to present the final version of the research to the Annual Meeting organized by the Central Bank of Uruguay. This event is the main economic forum in the country and it always gathers distinguished researchers, experts and policy makers. This Meeting ensures a wide dissemination of research, because attendance is free and the papers presented at the Meeting are available in the web site of the Central Bank.

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We also plan to elaborate an article to be presented to some specialized journal and at some international events like the meeting of LACEA.

This dissemination strategy is similar to the one employed in the case of a previous PEP project, carried out by a team that included Silvia Laens (Terra et al, 2006). In this case, the research was also disseminated in the meetings organized by PEP and it was chosen to be published as a MPIA Working Paper. We hope this project will have similar opportunities.

Finally, the research will be published in Spanish at CINVE’s web site, which is being reformulated at present to allow the download of papers. The specialized press usually takes CINVE’s work as raw material for their articles, so this will also allow the dissemination among the general public.

7. Short list of key references


Davies, J. (2004). “Microsimulation, CGE and Macro Modelling for Transition and Developing Economies”. University of Western Ontario, April


8. List of team members’ prior training and experience in the issues and techniques involved.

The research team will be composed by three researchers working at CINVE. The team will be coordinated by Cecilia Llambí (Economist, senior researcher at CINVE, aged 36, female) and will be composed by Silvia Laens (MA in Economics, senior researcher at CINVE, aged 62 female) and Nicole Perelmuter (Economist, junior researcher at CINVE, aged 28, female). The team has vast experience working with CGE models and microsimulations.

Cecilia Llambí is a senior researcher at CINVE since 2005. She has also worked as a researcher at the Instituto de Economía at the Facultad de Ciencias Económicas y Administración (Universidad de la República, Uruguay), and as an IADB consultant for some national educational programs. She has wide experience working with CGE models and microsimulations, and in the study of poverty, income distribution and labour market issues. Laens and Llambí have just finished a research using a dynamic CGE model\(^6\). This model is the first application of a dynamic CGE model to the case of Uruguay.

Silvia Laens has been a researcher at CINVE since 1981. She was the director of the institution between 1988 and 1990. She has held a position as a 4th degree researcher at the Facultad de Ciencias Sociales of the Universidad de la República) and a 5th. degree researcher (senior researcher) at the Facultad de Ciencias Económicas y Administración of the same university. During her career she has specialized in the use of Computable General Equilibrium Models, applied to trade and integration issues, and in relation to the labour market, and to poverty and inequality. She has also great experience in the area of the pension system.

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\(^6\) Laens and Llambí (2007).
Nicole Perelmuter has been a junior researcher at CINVE since 2002. She has specialized in tax policy, as well as in labour market analysis. Both, Nicole Perelmuter and Cecilia Llambí have vast experience in Household Surveys processing end econometric analysis.

9. Expected capacity building

Silvia Laens has accumulated vast experience in the development of CGE models, applied to diverse subjects, including the evaluation of tax policies. Recently, Laens and Llambí have developed a dynamic CGE model (first experience in the country) combined with microsimulations.

CINVE is interested in training a team of researchers (including junior researchers) to develop capacities in the application of this methodology, in particular to the evaluation of policy effects on poverty and inequality. Cecilia Llambí has worked on social subjects and she has experience working with CGE models, whereas Nicole Perelmuter has experience working with tax subjects. It is understood that this project will allow us to consolidate a working team that accumulates experience in the application of dynamic CGE models and microsimulations, deepening previous experience of some members of the team and generating more capacities in junior researchers. This is particularly important for CINVE because Silvia Laens is not too far from retirement and the continuity of this line of work in the institution largely depends on the consolidation of this research team. Up to now, CGE models along with microsimulation techniques have only been used at CINVE and at the Department of Economics, Universidad de la República. The maintenance of both teams of researchers working in this area is crucial for the improvement and dissemination of this methodological framework.

Also, it has to be mentioned that dynamic general equilibrium models are very recently being developed in Uruguay. It is our interest to deepen the experience that began with the dynamic model applied by Laens and Llambí in order to consolidate a stream of work in this type of models. This research is also an important step in capacity building for fiscal policy analysis within a general equilibrium framework, where no progress has been made in recent years.
It is expected that Cecilia Llambí and Nicole Perelmuter will work in all the areas of the project (i.e.: from building the new SAM, econometric estimations of key parameters and macro projections, the dynamic CGE model and the microsimulations). Silvia Laens will work mainly in the building of the dynamic CGE model, providing her vast experience to the rest of the team.

10. Any ethical, social, gender or environmental issues or risks which should be noted.

We understand there is no issue to emphasize.

11. List of past, current or pending projects in related areas involving team members
(name of funding institution, title of project, list of team members involved)

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<th>Name of Funding Institution</th>
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<td>National Policies of Competitiveness in Uruguay and its impact on the Mercosur deepness.</td>
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<td>PEP</td>
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